What is Claimed is:

1. A method for synchronizing and identifying a cell code for an orthogonal frequency division multiplexing (OFDM) based cellular communication system, comprising the steps of:

(a) building a time-domain frame structure for a cell search procedure, each frame in said frame structure consisting of a plurality of OFDM symbols, said frame structure exhibiting periodic signal pattern and containing the information about said cell code; and

(b) performing said cell search procedure including the steps of timing synchronization and cell code identification.

2. The method for synchronizing and identifying a cell code for an OFDM based cellular communication system as claimed in claim 1, wherein in step (b), said timing synchronization is to detect OFDM symbol timing and frame timing, and said cell code identification is to detect said cell code.

3. The method for synchronizing and identifying a cell code for an OFDM based cellular communication system as claimed in claim 1, wherein said cell search procedure in step (b) further includes a verification step to avoid false detection.

4. The method for synchronizing and identifying a cell code for an OFDM based cellular communication system as claimed in claim 1, wherein in a frame, there is at least one OFDM symbol that exhibits said periodic signal pattern and there is at least one OFDM symbol that contains the information about said cell code.

5. The method for synchronizing and identifying a cell code for an OFDM based cellular communication system as claimed in claim 1, wherein there are at least two

OFDM symbols in a frame that have the same data in some portions leading to said periodic signal pattern in a frame.

6. The method for synchronizing and identifying a cell code for an OFDM based cellular communication system as claimed in claim 1, wherein there is at least one unit formed by two or more successive OFDM symbols having said periodic signal pattern in a frame.

7. The method for synchronizing and identifying a cell code for an OFDM based cellular communication system as claimed in claim 1, wherein at least one OFDM symbol in a frame that contains the information about said cell code.

8. The method for synchronizing and identifying a cell code for an OFDM based cellular communication system as claimed in claim 1, wherein each OFDM symbol of length $N_{OFDM}$ samples consists of $N_{FFT}$-sample useful data and $N_{GI}$-sample cyclic prefix (CP), the $i$th OFDM symbol, indicated by CPICH$i$, is comprised of CP and $N_i$ repetitive duplicates of a $v_i$-point short sequence, where $N_{FFT} = v_i \cdot N_i$ and $N_i \geq 1$, the other OFDM symbols in said frame includes traffic channel (TCH) signal or another common pilot channel (CPICH) signal, CPICH signal and TCH signal are allocated in different OFDM symbols.

9. The method for synchronizing and identifying a cell code for an OFDM based cellular communication system as claimed in claim 8, wherein said cell search procedure in step (b) uses the correlation property of CP and said periodic signal pattern of said frame structure to detect said timing.

10. The method for synchronizing and identifying a cell code for an OFDM based

cellular communication system as claimed in claim 8, wherein said cell search procedure in step (b) uses the correlation property of CPICH signal to detect said cell code.

11. A time-domain frame structure used in cell detection for an orthogonal frequency division multiplexing (OFDM) based cellular communication system, said frame structure exhibiting periodic signal pattern to detect frame timing and containing the information about the cell code of desired cell in common pilot channel (CPICH) signal to identify said cell code.

12. The time-domain frame structure used in cell detection for an OFDM based cellular communication system as claimed in claim 11, wherein each frame in said frame structure consists of a plurality of OFDM symbols and each OFDM symbol of length $N_{OFDM}$ samples consists of $N_{FFT}$-sample useful data and $N_{GI}$-sample cyclic prefix (CP), the $i$th OFDM symbol, indicated by CPICH$i$, is comprised of CP and $N_i$ repetitive duplicates of a $v_i$-point short sequence, where $N_{FFT} = v_i \cdot N_i$ and $N_i \geq 1$, the other OFDM symbols in said frame includes traffic channel (TCH) signal or another common pilot channel (CPICH) signal, CPICH signal and TCH signal are allocated in different OFDM symbols.

13. The time-domain frame structure used in cell detection for an OFDM based cellular communication system as claimed in claim 11, wherein said time-domain frame structure is introduced in a cell search procedure including the steps of timing synchronization and cell code identification.

14. The time-domain frame structure used in cell detection for an OFDM based cellular communication system as claimed in claim 13, wherein said step of timing

synchronization is to detect OFDM symbol timing and frame timing, and said cell code identification is to detect said cell code.

15. The time-domain frame structure used in cell detection for an OFDM based cellular communication system as claimed in claim 11, wherein in a frame, there is at least one OFDM symbol that exhibits said periodic signal pattern and there is at least one OFDM symbol that contains the information about said cell code.

16. The frame structure used in cell detection for an OFDM based cellular communication system as claimed in claim 11, wherein in a frame, there is at least one OFDM symbol that exhibits said periodic signal pattern and there is at least one OFDM symbol that contains the information about said cell code.

17. The frame structure used in cell detection for an OFDM based cellular communication system as claimed in claim 11, wherein there are at least two OFDM symbols in a frame that have the same data in some portions leading to said periodic signal pattern in a frame.

18. The frame structure used in cell detection for an OFDM based cellular communication system as claimed in claim 11, wherein there is at least one unit formed by two or more successive OFDM symbols having said periodic signal pattern in a frame.

19. The frame structure used in cell detection for an OFDM based cellular communication system as claimed in claim 11, wherein at least one OFDM symbol in a frame that contains the information about said cell code.